

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-18 will be pending in the application subsequent to entry of this Amendment.

As a preliminary matter, in the Office Action Summary, item 9, it is indicated that “the specification is objected to by the examiner”. However, in reviewing the detailed Action and comments that follow nothing is specifically directed or commented upon in the specification. If indeed this is an intended objection then applicants request further information as to exactly what is objected to.

Discussion of Amended and New Claims

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to respond to issues presented in item 2 of the Official Action. Three new claims have been added directed to preferred aspects of the disclosure. Claims 6 and 15 have been amended in order delete recitation of “a foam shape”, responsive to item 2, second paragraph of page 2 and new claims 16 and 17 added specifying that the water-absorbing shaped body is porous.

Claim 7 has been amended in order to remove the parenthetical expressions and recite the same or similar information at the beginning of each step responsive to the examiner’s comments in item 2, third paragraph of the Official Action. Other adjustments have been made to claim 7 to render it consistent with the description. The amendments made to claim 7 are based on the descriptions in line 22 on page 14 to line 21 on page 15 of the original specification.

Claims 8, 9 and 11-14 have been objected to as lacking antecedent basis in the claims from which they depend. The adjustments made to claim 7 provide ample antecedent basis for these claims.

In view of the above amendments and comments, reconsideration and withdrawal of the rejections stated in item 2 of the Official Action is in order.

New claim 18 is based on the descriptions in line 22 on page 14 to line 21 on page 15 of the original specification.

The balance of the Official Action deals with prior art-based rejections of various claims as set out in items 4, 6 and 7 of the Official Action. These rejections are now addressed.

Two citations are not available as prior art. The assignee (Nippon Shokubai Co., Ltd.)

Dairoku et al (US 2004/0092688) is identical to the assignee of the present patent application. Therefore, Dairoku et al is available as prior art only under 35 U.S.C. 102(e), but does not fall under 35 U.S.C. 103 (see Final Paragraph (c) of 35 U.S.C. 103).

Tokukai (JP) 2003-64235 was published on March 5, 2003, which is subsequent to the priority date (January 27, 2003) of the present patent application and as such is not available as prior art.

Response to Rejection Based on Yamamura et al

Yamamura et al (U.S. 6,365,644) discloses a method of curing a photo-curable resin composition suitable for photo-fabrication of three-dimensional objects, i.e., to a method of manufacturing a three-dimensional object (cured object). The three-dimensional object, which is the object of Yamamura et al, is used for a design model, a trial product for confirming functionality, or a master mold. In order to use the three-dimensional object as a trial product, for example, it is necessary that the three-dimensional object have high dimensional accuracy in accordance with the design in fine processing, mechanical strength and heat resistance that is sufficient to withstand conditions of use (*see* lines 8 to 15 in column 2, lines 50 to 58 in column 2, and lines 20 to 26 in column 18).

Further, the curing in Yamamura et al uses a method of “obtaining a three-dimensional object (cured object) by integrally laminating a plurality of photo-curable resin layers formed by repeating an irradiation step for a predetermined number of times”.

Yamamura et al, discloses or suggests nothing about water-absorbing properties of the three-dimensional object to be obtained. Further, Yamamura et al does not state that the three-dimensional object has no water-absorbing properties (or has water-resistant and moisture-resistant properties). That is, Yamamura et al contains no statement that actively eliminates a case where the three-dimensional object has water-absorbing properties. However, in view of the technical content of the cited document, applicants consider that the three-dimensional object has no water-absorbing properties.

Moreover, Yamamura et al discloses that a “cationic photoinitiator” is used, that the resin composition contains a compound having an oxetane ring and an epoxy compound, that an “ethylenically unsaturated compound” may be used as another component of the resin compound

(see line 47 in column 13 to line 32 in column 15), and that “a polymerization is performed by selectively irradiating light”.

Applicants’ invention as defined by the claims now under review enjoy significant technical differences over the disclosures of the Yamamura et al reference. While it is true that the present invention and Yamamura et al have “photo polymerization” in common, they belong to completely different and distinct technical fields. Therefore, the technical content of the present invention is completely different from that of Yamamura et al.

Since the present invention and Yamamura et al yield different cured objects having different properties, the specific composition of a resin composition used in Yamamura et al will necessarily be completely different from the specific composition of a monomer composition used in the present invention

That is, in Yamamura et al, the resin composition may or may not contain an “ethylenically unsaturated compound”. Therefore, the components of the resin composition of Yamamura et al are completely different from the components of the monomer composition of the present invention which consists mainly of a “water-soluble ethylenically unsaturated monomer”. Further, Yamamura et al completely fails to disclose that “the water-soluble ethylenically unsaturated monomer contains not less than 50 mol % of acrylic acid (salt)”.

Further, the specific polymerizing steps, that is the polymerizing steps actually performed, of the present invention are completely different from those of Yamamura et al.

Yamamura et al discloses nothing about a polymerizing method equivalent to the step of “dissolving the monomer composition into an aqueous solution (polymerizing the monomer composition in an aqueous solution state)” and the step of “(stopping radiation of the light, and) shaping the aqueous solution, which includes a polymer as a part thereof (a shaping step)”, both of which are adopted in the polymerizing method of the present invention. Yamamura et al performs a polymerization without using a solvent, and does not disclose anything about a solvent.

Furthermore, according to the polymerizing method of the present invention, the gelation of the aqueous solution makes it easy to form a shape of the water-absorbing shaped body, so that the water-absorbing shaped body can be shaped into a desired shape directly in the polymerization process. On the other hand, as explained above, Yamamura et al requires a

complicated shaping step (curing method) of “integrally laminating a plurality of photo-curable resin layers formed by repeating an irradiation step for a predetermined number of times”.

Therefore, the shaping step of the present invention is completely different from that of Yamamura et al. Further, the object and effects of the present invention are completely different from those objects and effects of Yamamura et al.

Note that Yamamura et al discloses that “the irradiation step is repeated for a predetermined number of times, with or without changing the pattern subjected to light irradiation.” For this reason, applicants consider that Yamamura et al may suggest, that “a polymerization is performed by irradiating light intermittently”. However, as described above, the specific polymerizing steps of the present invention are completely different from those of Yamamura et al.

Further, Yamamura et al discloses nothing about a step equivalent to the step of “(stopping radiation of the light, and) shaping the aqueous solution, which includes a polymer as a part thereof (a shaping step)”, which is adopted in the manufacturing method of the present invention. In view of this applicants have added new claim 17.

For the above reasons it will be apparent that Yamamura et al neither anticipates nor is suggestive of the subject matter defined by applicants’ claims.

The rejections in items 6 and 7 of the Official Action are based primarily on the Yamamura et al reference as the primary reference and secondary references the availability of which as prior art is seriously in doubt. As applicants have distinguished their claims over the Yamamura et al reference by itself so too are the claims distinguished over the combination of documents given in items 6 and 7 of the Official Action assuming *arguendo* that the secondary references are available as prior art (applicants dispute this).

For completion of the record the following additional comments and observations are presented relative to the two dubious references.

Although applicants firmly believe that two of the citations are not available as prior art, they provide a brief explanation of the technical differences between the cited references and the present invention.

Paragraph [0029] of Dairoku et al discloses that a “water-soluble ethylenically unsaturated monomer” is a main component and that “the water-soluble ethylenically

unsaturated monomer contains not less than 50 mol % of acrylic acid (salt)". Further, paragraph [0080] of Dairoku et al or the like discloses that the monomer composition is dissolved into an aqueous solution "and is polymerized in an aqueous solution state".

However, neither Dairoku et al nor Tokukai 2003-64235 disclose anything about a step equivalent to the step of "(stopping radiation of the light, and) shaping the aqueous solution, which includes a polymer as a part thereof (a shaping step)", which is employed in the manufacturing method of the present invention.

For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter and are in proper formal order. Reconsideration and allowance are solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Arthur R. Crawford
Reg. No. 25,327

ARC:eaw
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100